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DEP & REF  
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STATUS AND EVIDENCE  
NIXON & VANDERHUYE P.C.  
APR 26 11:50 AM AT LAW

April 20, 2004

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Subject: **REQUEST FOR REFUND TO DEPOSIT ACCOUNT**  
Deposit Account No. 14-1140  
Statement Date: April 5, 2004  
Date Posted: March 10, 2004  
Control No.: 2  
Fee Code: 1201; \$344.00  
Our Ref.: 2635-22

To whom it may concern:

Regarding the Monthly Statement of Deposit Account dated April 5, 2004, (copy attached), we believe there is a fee related error therein, which has resulted in a charge to our Deposit Account that appears to be unwarranted. Please refer to the following explanation and issue a refund as soon as possible.


We filed an RCE application on September 8, 2003 together with an amendment adding new claims 9 through 20. We paid \$334.00 for the extra claim fee (\$84.00 for each additional independent claim) which was the correct amount at that time. Therefore please refund our Account No. 14-1140 in the amount of \$344.00. Our cover sheet to the USPTO, preliminary amendment and postcard receipt are attached for your review.

Thank you for your time and assistance, and if you have any questions, please do not hesitate to call me at the above number.

Very truly yours,

NIXON & VANDERHUYE P.C.

By:

  
Larry S. Nixon

LSN:vc  
Enclosures

Adjustment date: 06/08/2004 EEKUBAY1  
03/10/2004 RGRADEN 00000002 141140 09885023  
01 FC:1201 344.00 CR

03/04 261	09775805	1483	\$1,300.00	\$9,595.98
03/04 262	09775805	1483	\$1,300.00	\$10,895.98
03/04 263	09775805	1483	\$1,300.00	\$12,195.98
03/05 4	10205004	1201	\$200.00	\$12,395.98
03/05 5	10205004	1201	\$200.00	\$12,595.98
03/05 7	10475760	1615	\$200.00	\$12,795.98
03/05 124	09722544	1253	\$200.00	\$12,995.98
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03/08 7	10021302	1201	\$200.00	\$13,187.98
03/08 128	09854048	1002	\$200.00	\$13,387.98
03/08 128	09854048	1002	\$150.00	\$13,537.98
03/09 3	09013524	1000	\$100.00	\$13,637.98
03/09 474	10182003	1001	\$200.00	\$13,837.98
03/09 475	10205007	1001	\$200.00	\$14,037.98
03/09 476	10182003	1001	\$200.00	\$14,237.98
03/09 477	10205007	1001	\$200.00	\$14,437.98
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03/10 4	09775805	1400	\$100.00	\$14,837.98
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03/11 58	60420000	1001	\$100.00	\$15,237.98
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03/12 2	09013525	1001	\$100.00	\$15,537.98
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03/12 18	PAYMENT	1004	-\$15,000.00	\$2,037.98
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03/15 209	0580070	1001	\$200.00	\$4,437.98
03/16 1	09013525	1001	\$200.00	\$4,637.98
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03/17 1	10479208	1001	\$200.00	\$5,037.98
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03/17 28	10400616	1001	\$100.00	\$6,657.98
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03/18 2	09497552	1001	\$200.00	\$7,457.98
03/18 3	09497552	1001	\$200.00	\$7,657.98

STATUS AND ENTRY  
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2009 APR 26 PM 3:42







## REQUEST

## TRANSMITTAL

Submission of 37 C.F.R. § 1.128, which provides for continued examination of an application, shall not be made until the fee is paid. See The American Inventors' Protection Act.

This is a Request for Continued Examination

**NOTE:** 37 C.F.R. § 1.128 is effective on the date of the amendment, and the applicant shall file a continuation of the application within 12 months of the date of the amendment.

## 1. Submission required under 37 C.F.R. § 1.128

- a. ☐ Previously submitted
- i. ☐ Consider the amendment (Any amended claim(s) shall be considered as new.)
- ii. ☐ Consider the arguments
- b. ☒ Enclosed
- i. ☒ Amendment/Reply
- ii. ☐ Affidavit(s)/Declaration(s)
- iii. ☐ Information Disclosure
- iv. ☒ Other: Figures 8 and 9

## 2. Miscellaneous

- a. ☐ Suspension of action on the application for a period of \_\_\_\_\_
- b. ☐ Other \_\_\_\_\_

## 3. Fees

- The RCE fee under 37 C.F.R. § 1.171 is required.
- a. ☒ The Director is hereby authorized to debit the fee from the Deposit Account No. 14-171-00.
- i. ☒ RCE fee required under 37 C.F.R. § 1.171
- ii. ☒ Extension of time fee under 37 C.F.R. § 1.171
- iii. ☒ Other Additional Independent
- b. ☒ Check in the amount of \$ \_\_\_\_\_ for independent claims (2) \_\_\_\_\_

Name (Print Type)

Signature

I hereby certify that this correspondence is being sent in an envelope addressed to: Mail Stop RCE, Communications Division, Patent and Trademark Office on:

Name (Print Type)

Signature

Official Mail Statement: This form is subject to the provisions of 37 C.F.R. § 1.128. If you are required to submit a statement of facts, you must submit it with this form. DO NOT send this form to the Patent and Trademark Office, P.O. Box 1400, Alexandria, VA 22304-1400.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

STATUS: PENDING  
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APR 26 PM 3:20

KIMATA et al.

Appl. No. 09/885,023

Filed: June 21, 2001

For: GAS SENSOR

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the Office action dated April 6, 2001, regarding the  
above-identified application as follows:



**AMENDMENTS TO THE CLAIMS**

2001 APR 26 PM 3:21

This listing of claims was amended to add claims, and changes, of claims in the application:

1. (Currently Amended) A gas sensor comprising a cylindrical housing having an element insertion hole extending from a proximal end of said housing and a distal end thereof, a gas sensing element airightly fitted in said element insertion hole of the housing, and a cylindrical housing having an air side cover attached to a proximal end of said housing so as to confine an inert atmosphere therein and a measured gas atmosphere in a distal end of said housing so as to confine a measured gas atmosphere therein.

a sealing material is provided in a proximal end of said element insertion hole for sealing a proximal end of said element insertion hole and an outer surface of said element insertion hole, and

a cushion-filler is provided in a proximal end of said element insertion hole for sealing a proximal end of said element insertion hole and the outer surface of said element insertion hole.

2. (Previously Amended) A gas sensor as recited in claim 1, wherein a filling percentage of said cushion-filler in a proximal end of said element insertion hole and the outer surface of said element insertion hole is in the range from 10% to 80%.

3. (Original) The gas sensing element with claim 1, wherein an injection port is provided near an open end of said element insertion hole at the distal end of said insulator for facilitating a filling of said sealing material or said cushion filler.

4. (Original) The gas sensing element with claim 1, wherein said element insertion hole comprises a large-diameter portion and a smaller-diameter portion, and an inner diameter of said large-diameter portion is larger than that of said smaller-diameter portion.

5. (Original) The gas sensing element with claim 1, wherein said sealing material and/or said cushion filler is disposed to fit at least two opposed surfaces of the inner surface of said element insertion hole and the outer surface of said gas sensing element.

6. (Currently Amended) A gas sensing device comprising a cylindrical insulator having an element insertion hole extending from a proximal end thereof, a gas sensing element airtightly fixed to said element insertion hole of the insulator, and a cylindrical housing having an inner diameter larger than that of said insulator, with an air side cover attached to a proximal end of said housing so as to confine an axial atmosphere therein and a measured gas side cover attached to a distal end of said housing so as to confine a measured gas atmosphere therein.



a sealing material is provided in a distal end of said element insertion hole for sealing a clearance between an inner surface of said element insertion hole and an outer surface of said gas sensing element.

a cushion filler is provided in a distal end of said element insertion hole for sealing a clearance between an inner surface of said element insertion hole and the outer surface of said gas sensing element.

said insulator constitutes a main body and a separate body attached via a spacer to a distal end of said main body, and said element insertion hole extends across both of said main body and said separate body.

said cushion filler is provided in a distal end of said separate body.

7. (Previously Presented) A gas sensor as claimed in claim 1, said cushion filler being capable of withstanding a load of from 5N to 1,000N.

8. (Previously Presented) A gas sensor as claimed in claim 1, said cushion filler being capable of withstanding a load of from 5N to 1,000N.

9. (New) A gas sensor comprising:  
a cylindrical insulator having a distal end of said element insertion hole passing through its central region;

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a gas sensing element disposed in said element insertion hole and being  
securely fixed to opposite ends of said cylindrical insulator to prevent said gas sensing  
element from swinging within said cylindrical insulator, and

a cylindrical housing having an inner space for receiving said cylindrical  
insulator and said gas sensing element, with an air side cover attached to a proximal  
end of said housing so as to confine a measured atmosphere therein and a measured gas  
side cover attached to a distal end of said housing so as to confine a measured gas  
atmosphere therein.

10. (New) A gas sensor as provided in claim 9, further including a sealing  
material provided at one end of said element insertion hole for securely fixing said gas  
sensing element to said cylindrical insulator and for sealing a clearance between an  
inner surface of said element insertion hole and an outer surface of said gas sensing  
element.

11. (New) A gas sensor as provided in claim 10, further including a cushion filler  
provided at an end opposite to said one end of said element insertion hole for securely  
fixing said gas sensing element to said cylindrical insulator and for sealing a clearance  
between an inner surface of said element insertion hole and the outer surface of said  
gas sensing element.

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12. (New) A gas sensor in accordance with claim 11, wherein a filling percentage of said cushion filler provided between an inner surface of said element insertion hole and the outer surface of said gas sensing element is in the range from 10% to 80%.

13. (New) The gas sensor in accordance with claim 11, wherein an injection port is provided near an open edge of said element insertion hole at the distal end of said insulator for facilitating a filling operation of said sealing material or said cushion filler.

14. (New) The gas sensor in accordance with claim 9, wherein said element insertion hole comprises a large-diameter portion and a smaller-diameter portion, and an inner diameter of said large-diameter portion is larger than that of said smaller-diameter portion.

15. (New) A gas sensor comprising:  
a cylindrical insulator having an element insertion hole extending through its central region;

a gas sensing element disposed within the element insertion hole and being securely fixed to opposite ends of said cylindrical insulator to prevent said gas sensing element from swinging within said cylindrical insulator;

a cylindrical housing having an inside space for receiving said cylindrical insulator and said gas sensing element, with an air side cover attached to a proximal end of said housing so as to confine an outer atmosphere therein and a measured gas



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side cover attached to a distal end of said housing so as to confine a measured gas atmosphere therein; and

wherein said insulator constitutes a main body and a separate body attached via a spacer to a distal end of said main body, so that said element insertion hole extends across both of said main body and said separate body.

16. (New) A gas sensor as claimed in claim 15, further including a sealing material provided at one end of said element insertion hole for securely fixing said gas sensing element to said cylindrical insulator and for sealing a clearance between an inner surface of said element insertion hole and an outer surface of said gas sensing element.

17. (New) A gas sensor as claimed in claim 16, further including a cushion filler provided at an end opposite to said one end of said element insertion hole for securely fixing said gas sensing element to said cylindrical insulator and for sealing a clearance between an inner surface of said element insertion hole and the outer surface of said gas sensing element.

18. (New) A method for protecting a gas sensing element of a gas sensor assembly by fixedly securing said gas sensing element at opposite ends of a central bore hole disposed within a cylindrical insulator, thereby preventing said gas sensing element from swinging within said cylindrical insulator, after said gas sensing element and cylindrical insulator are assembled within a housing of the gas sensor assembly.

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19. (New) An improvement for a gas sensor having an elongated gas sensing element mounted within and extending through an elongated aperture of an insulating member, said elongated aperture having a first larger cross-section portion axially spaced from a second relatively smaller cross-section portion and wherein said gas sensing element is fixedly sealed in a gas-tight manner within said larger cross-section portion using a sealing material, said improvement comprising:

a cushion material, softer than said sealing material, disposed within said smaller cross-section portion of the aperture and between the insulating member and the gas sensing element.

20. (New) A method for protecting a gas sensor having an elongated gas sensing element mounted within and extending through an elongated aperture of an insulating member, said elongated aperture having a first larger cross-section portion axially spaced from a second relatively smaller cross-section portion and wherein said gas sensing element is fixedly sealed in a gas-tight manner within said larger cross-section portion using a sealing material, said method comprising:

providing a cushion material, softer than said sealing material, within said smaller cross-section portion of the aperture and between the insulating member and the gas sensing element.

KIMATA et al.  
Appl. No. 09/885,023  
September 8, 2003

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**AMENDMENTS TO THE DRAWINGS**

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The attached sheets of drawings includes changes to Figs.8 and 12 as required by the Examiner in the Office Action. These sheets, which includes Figs.8 and 12, replace the original sheets including Fig.8 and 12.

Attachment: Replacement Sheet(s)



**REMARKS/ARGUMENTS**

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Claims 1-20 stand in the present application, claims 1 and 6 having been amended and new claims 9-20 having been added. Applicants note with appreciation the Examiner's indication of allowable subject matter in claim 3, but respectfully submit that in view of the above amendments and the following remarks that all of the claims standing in the application are in condition for allowance.

As required in the Office Action, revised Figures 8 and 12 are submitted herewith.

The Examiner has rejected claims 1, 2, 4, 5 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Noda and has rejected claims 6 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of Kuisell. Applicants respectfully traverse the Examiner's § 103 rejections of the claims.

Applicants' invention is directed to a gas sensor having a gas sensing element fixed at both ends of a cylindrical insulator – at the proximal end with sealing material and at the distal end by a soft cushion filler. Prior art devices only fixed the gas sensing element at one end of the insulator. An important feature of Applicants' invention is the additionally fixed end, preferably by use of the soft cushion filler which allows for shocks applied from the outside to be absorbed. As a result, the gas sensing element is prevented from being directly subjected to shocks transmitted from outside of the gas sensor.

More particularly, Applicants' gas sensing element is held at both its proximal and distal ends. Therefore, the gas sensing element does not swing like a pendulum when receiving shocks or vibrations. Accordingly, Applicants' invention prevents a

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concentrated stress from acting on a portion serving as a swing center of the gas sensing element (i.e., a portion immediately below the portion firmly fixed with the sealing material) and also prevents the gas sensing element from colliding with the inner surface of the insulator. Therefore, the present invention effectively prevents the gas sensing element from easily cracking or breaking. Applicants have amended independent claims 1 and 6 to more clearly recite that the sealing material and cushion filler are respectively disposed at opposite ends of the element insertion hole, i.e., the proximal and distal ends of the element insertion hole.

Neither Noda nor Kuisell teaches or suggests a claimed cushion filler, or any other material, provided at the opposite (or distal end) of the element insertion hole for sealing a clearance between an inner surface of the element insertion hole and the outer surface of the gas sensing element. As clearly shown in Figure 1 of Noda, both the sealing element 32 and cushion element 34 are disposed at the same end (proximal end) of the element insertion hole. Indeed, sealing element 32 and cushion layer 34 are shown to be abutting at one end of insulator 4. This arrangement, of the sealing element 32 abutting against the cushion layer 34 at one end of the insulator 4, is also described in the cited reference at, *inter alia*, the Abstract and column 3, lines 3-20. Thus, Noda will suffer the same disadvantages as the prior art devices described in the present application at pages 1 and 2 with reference to Figure 13.

Kuisell has merely been cited by the Examiner for teaching "a gas sensor having an insulator comprised of separate bodies attached at their ends by a glass spacer (Figure 1)." Accordingly, it should be clear that Kuisell does not solve the deficiencies noted above with respect to Noda.

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Hence, unlike Applicants' invention, the gas sensing elements disclosed in these references will exhibit a swinging motion like a pendulum, when shocks or vibrations are received, and, therefore, will tend to crack or break. Accordingly, claims 1-6 which now more clearly recite that the sealing material and cushion filler are disposed at opposite ends of the insulator, and their respective dependent claims are believed to patentably define over the cited references taken either singly or in combination.

Newly added claims 9-18 also recite the above-described patentable distinction over the cited art. More particularly, newly added independent claims 9 and 16 are directed to gas sensors in which the gas sensing element is securely fixed at opposite ends of a cylindrical insulator. Newly added independent claim 18 recites a method for protecting a gas sensing element of a gas sensor assembly by fixedly securing the gas sensing element at opposite ends of a central bore hole disposed within a cylindrical insulator. Accordingly, all of newly added independent claims 9, 16 and 18 and their respective dependent claims are believed to patentably define over the cited references, taken either singly or in combination, for the same reasons given above with respect to claims 1 and 6.

Newly added claims 19 and 20 are directed to apparatus and method wherein a sealing material is disposed in the larger cross-sectional area of an elongated aperture, through which the gas sensing element is mounted, and a cushion material is disposed in the smaller cross-sectional portion of the elongated aperture. Since the cited art does not teach or suggest placing a cushion material in the smaller cross-section of the elongated aperture of an insulator, these claims are also believed to patentably define over the cited art.



KIMATA et al.  
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September 8, 2003

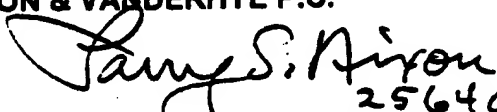
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Therefore, in view of the above amendments and remarks, it is respectfully  
requested that the application be reconsidered and that all of claims 1-20, now standing  
in the application, be allowed and that the case be passed to issue. If there are any  
other issues remaining which the Examiner believes could be resolved through either a  
supplemental response or an Examiner's amendment, the Examiner is respectfully  
requested to contact the undersigned at the local telephone exchange indicated below.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By:

  
25640  
for Chris Comuntzis  
Reg. No. 31,097

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